

PEM FUEL CELL STACK DEVELOPMENT FOR AUTOMOTIVE APPLICATIONS

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Introduction

Presently, the major challenges to the introduction of fuel cell power systems for automotive applications are to maximize the effective system power density and minimize cost. The material cost, especially for Platinum, had been a significant factor until recent advances by Los Alamos National Laboratory and others in low Platinum loading electrode design has brought these costs within control. Since the initiation of its PEM stack development efforts, MTI has focused on applying its system and mechanical engineering heritage on both increasing power density and reducing cost. In May of 1995, MTI was selected (along with four other companies) as a subcontractor by the Ford Motor Company to participate in Phase I of the DOE Office of Transportation Technology sponsored PNGV Program entitled: "Direct-Hydrogen-Fueled Proton-Exchange-Membrane (PEM) Fuel Cell System for Transportation Applications". This Program was instituted to:

- Advance the performance and economic viability of a direct-hydrogen-fueled PEM fuel cell system,
- Identify the critical problems that must be resolved before system scale-up and vehicle integration, and
- Integrate the fuel cell power system into a sub-scale vehicle propulsion system.

The Phase I objective was to develop and demonstrate a nominal 10 kW stack meeting specific criteria. Figure 1 is a photograph of the stack used for these demonstrations. After completion of Phase I, MTI was one of only two companies selected to continue into Phase II of the Program. This paper summarizes Phase I stack development and results.

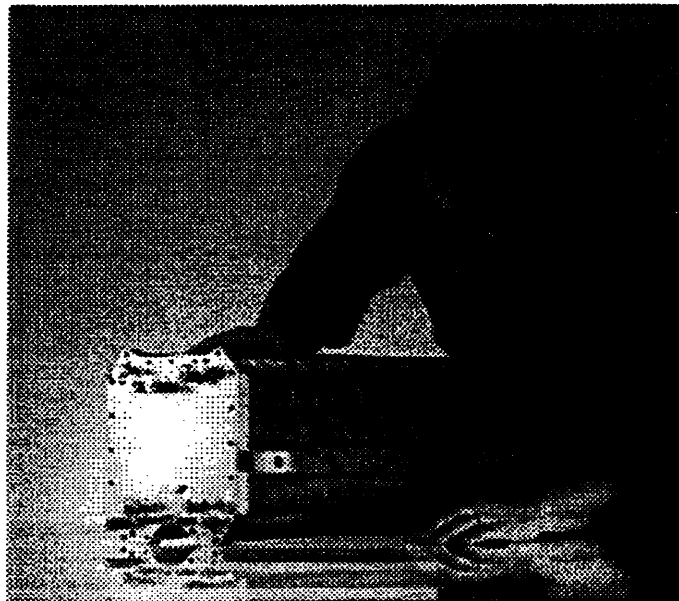


Figure 1 - MTI 10 kW Fuel Cell Stack